Summary of the Invention

The invention comprises an adjustable air cushion bicycle seat hydraulic ram system mounted within the seat post of a bicycle frame, having a hollow ram with one closed first end attached to the bicycle seat, and the other open second end of the ram slideably mounted within an internal reservoir positioned within the seat post such that the ram cap closes the internal reservoir. This internal reservoir is in communication with an external pressurized reservoir whose liquid level and quantity of air may be adjusted. Preferred liquids are lubricating oils that do not compress under pressure while minimizing sliding friction pressure of the ram. They also preferably maintain their viscosity over the operating range of the bicycle. Preferably, they contain fibers that aid in preventing seal leakage. A preferred oil is one that not only maintains its viscosity under normal conditions, but contains fibers, which minimizes O-ring leakage.

The first end of the ram extends sufficiently to position the bicycle seat at the desired height. If additional height is required with the ram in a fully extended position, an extender may be included between the end of the ram and the seat. The second end of the ram, when inserted, forms a variable sized internal reservoir, which is associated with the external pressurized air/liquid reservoir to selectively fill the internal reservoir with a pressurized air column of a desired height and volume to form an air cushion within the ram to provide the desired ride cushion. By varying the length and pressure of the air column therein, the ride cushion is adjusted. For example, the longer the column of air, the softer the ride; thereby requiring more air pressure to be injected to maintain the same ride. To minimize the size of the external pressurized air/liquid reservoir, generally more liquid is injected into the internal reservoir; thereby minimizing the amount of air resulting in a harder ride. Thus, either air and/or liquid may be selectively directed into the internal reservoir to maintain the desired ride.

The external pressurized air/liquid reservoir has a liquid fill port to adjust the volume and height of the liquid. After filling to a desired height, the fill port is closed and the air/liquid reservoir is pressured. As air is injected into the air/liquid reservoir, the air forces liquid into a fill tube and through a valve in communication with the internal reservoir forming a column of liquid therein. This continues until the level of the